

IN THE CLAIMS

1-35 (canceled)

36. (previously presented) A process for the partial thermochemical vacuum treatment of metallic workpieces comprising:

simultaneously vacuum treating several metallic workpieces having defined cavities and a region to be treated and an external surface region that is not to be treated, wherein the workpieces are installed in a mold body having at least one mold cavity and several openings through which a carbon containing atmosphere enters the cavities of the workpieces, in-wherein the workpieces are enclosed in the mold body in such a way that no thermochemical treatment takes place on the external surface and the region to be treated is thermochemically treated, wherein the thermochemical treatment is carried out under the action of a plasma and that the mold body consists of an electrically conducting material.

37. (previously presented) A process according to claim 36, wherein in each case at least one surface region of the cavity of the workpiece is screened by a sleeve that is inserted to protect the screened region of the cavity against a thermochemical treatment, whereas at least one additional surface region of the cavity is subjected to the thermochemical treatment.

38. (previously presented) A process according to claim 36, wherein the metallic workpiece comprises steel and the thermochemical treatment is carburization.

39. (previously presented) A process according to claim 36, wherein a mold body having a plurality of mold cavities receives one workpiece per mold cavity.

40. (previously presented) A process according to claim 36, wherein the mold body is formed as a housing with an upper part and that at least the upper part has openings that

communicate with the cavities in the workpieces and through which the carbon-containing atmosphere enters the said workpieces.

41. (previously presented) A process according to claim 36, wherein between the surface regions not being treated of the workpieces and the mold body sleeves are employed for sealing purposes.

42. (previously presented) A process according to claim 36, wherein a plurality of mold bodies are combined to form a batch.

43. (previously presented) A process according to claim 36, wherein the process is carried out in a vacuum range between 10 Pa and 3000 Pa.

44. (previously presented) A process according to claim 37, wherein the process is carried out with plasma voltages of between 200 and 2000 volts.

45. (previously presented) A process according to claim 44, wherein the plasma is used in pulsed form.

46. (previously presented) A process according to claim 45, wherein the connection time is between 10 and 200 μ s and the pause time is between 10 and 500 μ s.

47. (previously presented) A process according to claim 36, wherein the carbon-containing gas is at least one hydrocarbon selected from the group consisting of methane, ethane, propane and acetylene.

48. (previously presented) A process according to claim 47, wherein at least one gas selected from the group consisting of argon, nitrogen and hydrogen is added to the carbon-containing gas wherein, the proportion of the at least one hydrocarbon being chosen between 10 and 90 vol. %.

49. (previously presented) A process according to claim 36, wherein the material for the mold bodies is graphite.

50. (previously presented) A process according to claim 36, wherein the mold bodies comprise arbon fiber composite CFC is used as material for the mold bodies.

51. (previously presented) A process according to claim 36, wherein a material that does not exhibit any distortion phenomena at a temperature of at least 1050°C is used as material for the mold bodies.

52. (previously presented) A process according to claim 38, wherein the plasma-side ends of the at least one mold cavity of the mold bodies are formed in a plasma-tight manner opposite the respective workpiece.

53. (previously presented) A process according to claim 36, wherein the workpieces within the mold body are subjected to a heating procedure before the carburization.

54. (previously presented) A process according to claim 36 wherein the workpieces within the mold body are subjected to a diffusion procedure after the carburization.

55. (previously presented) A process according to claim 36, wherein the workpieces within the mold body are subjected to a high pressure gas quenching after the diffusion procedure.

56. (previously presented) A process according to claim 55, wherein the workpieces within the mold body are subjected after the high pressure gas quenching to at least one further treatment from the group consisting of deep cooling and annealing.

57. (previously presented) An apparatus for use in a single-chamber unit or in a multi-chamber throughflow unit for the partial thermochemical vacuum treatment of metallic workpieces comprising at least one reusable mold body that comprises a temperature-resistant

material to cover surface regions of a workpiece not to be treated during the treatment of the remaining surface regions, wherein several mold cavities are provided in the mold body for the insertion of several workpieces, wherein the workpieces can be enclosed in the mold cavity in such a way that no thermochemical treatment takes place on the external surfaces of the workpieces; wherein the mold body is formed as a housing and comprises an electrically conducting material and the workpieces can be enclosed in the mold cavity in such a way that when using a plasma no plasma is formed between the mold body and the workpiece.

58. (canceled)

59. (previously presented) An apparatus according to claim 57, wherein the mold body has several openings that communicate with the cavities of the in each case associated workpieces

60. (previously presented) An apparatus according to claim 57, wherein the mold body is formed as a housing with an upper part, and that at least the upper part has several openings that communicate with the cavities.

61. (previously presented) An apparatus according to claim 60, wherein the mold body comprises a lower part that has several openings, wherein the axes of the openings in the upper part and in the lower part coincide.

62. (previously presented) An apparatus according to claim 61, wherein between the lower part and upper part of the mold body there is arranged a separating groove running along the circumference, which permits a telescopic movement between the lower part and upper part.

63. (currently amended) An apparatus according to claim 57 58, wherein the plasma-side ends of openings in the mold body opposite the respective workpiece are formed in a plasma-tight manner.

64. (previously presented) An apparatus according to claim 57, having sleeves that can be inserted between the workpiece and a lower part on the one hand and between the workpiece and an upper part on the other hand, and which match the workpiece in such a way that surface regions of the workpieces not being treated are excluded from the thermochemical treatment.

65. (previously presented) An apparatus according to claim 57, wherein a plurality of mold bodies are combined by means of a transporting frame to form a batch.

66. (previously presented) An apparatus according to claim 65, wherein the transporting frame comprises crosspieces for arranging mold bodies next to one another and on top of one another.

67. (previously presented) An apparatus according to claim 57, wherein the mold body consists of graphite.

68. (previously presented) An apparatus according to claim 57 wherein the mold body comprises carbon fiber composite CFC.

69. (previously presented) An apparatus according to claim 57, wherein the mold bodies comprise a material that does not exhibit any distortion phenomena at a temperature of at least 1050°C.

70. (currently amended) An apparatus according to claim 57 58, wherein that the mold body is arranged within an evacuable chamber with an inlet for at least one hydrocarbon and is connected as a cathode for the formation of a plasma.

71. (previously presented) A process according to claim 43, wherein the process is carried out in a vacuum range between 50 Pa and 1000 Pa.

72. (previously presented) A process according to claim 44 wherein the process is carried out with plasma voltages between 300 and 1000 volts.

73. (previously presented) An apparatus according to claim 69, wherein the material does not exhibit any distortion phenomena at a temperature of up to at least 1200°C.

74. (canceled)

75. (new) A process for the partial thermochemical vacuum treatment of metallic workpieces comprising:

simultaneously vacuum treating several metallic workpieces having defined cavities and a region to be treated and an external surface region that is not to be treated, wherein the workpieces are installed in a mold body having at least one mold cavity and several openings through which a carbon containing atmosphere enters the cavities of the workpieces, wherein the workpieces are enclosed in the mold body in such a way that no thermochemical treatment takes place on the external surface and the region to be treated is thermochemically treated, wherein the thermochemical treatment is carried out under the action of a plasma and that the mold body consists of an electrically conducting material wherein the mold body is formed as a housing with an upper part and that at least the upper part has openings that communicate with the cavities in the workpieces and through which the carbon-containing atmosphere enters the workpieces, wherein sleeves are positioned between the surface regions of the workpieces not being treated and the mold body.